

*Urszula Motowidlak\**

## **SOCIAL MOBILITY IN POLISH TRANSPORT WITHIN URBAN AREAS IN THE CONTEXT OF THE DEVELOPMENT OF SUSTAINABLE TRANSPORT**

**Abstract.** Transport is one of the most important sectors of the state's economy. Its appropriate organization, mainly in urban areas, can effectively meet the needs of passengers. Those needs arise from a variety of reasons; however, transport is most often associated with daily access to work, school, college, offices and cultural and sporting facilities. Governments of large metropolitan centers, including Polish government, are facing enormous challenges related to provision of transport. Due to the high number of population, and hence extensive transport needs, these authorities are urged to use modern and efficient transport solutions. The development of society and the access to new technological possibilities and modern commercial solutions have influenced the development of transport in urban areas, as shown in the example of agglomeration.

**Keywords:** transportation, urban transport, individual transport, sustainable transport, social mobility

JEL: O18, R49, R59

### **1. INTRODUCTION**

The organization of transport is one of the most important challenges that large, urbanized centers are facing. The objective of this study is to identify changing needs in terms of social mobility and to analyse the direction of transport development in Polish urban areas, with particular emphasis on the metropolis of Poznan.

Nowadays, public transport often loses the competition to a car. Road transport plays a central role in passenger transport provision within a city or metropolis. This leads to many negative effects, among which the most frequently mentioned ones are: congestion, especially during traffic rush hours, and a large number of road accidents and collisions (Bartniczak 2013: 18). In addition, this trend has a negative impact on the environment. In the era of a growing number of individual automobiles, local authorities should implement measures to meet the transport needs of residents using public transport. It is important to implement

---

\* Uniwersytet Łódzki, Wydział Ekonomiczno-Socjologiczny, Zakład Logistyki.

procedures designed to enhance public transport and to build awareness of the need for residents to switch to public transport. These actions should focus primarily on the construction and modernization of road infrastructure. They should also promote public transport as the optimal means of transport in terms of economy, time, safety, and environmental protection. Moreover, the inhabitants of large modern cities should have access to many means of transport.

## 2. THE ESSENCE OF TRANSPORT NEEDS

The need for transport has accompanied man since the dawn of history. Along with the evolution of societies and socio-economic progress, came the need for deliberate and organized transport of goods, people, or messages using specialized resources and equipment. Socio-economic development and progress have had considerable impact on the effective organization of transport, making it more suitable to meet the passengers' needs. Access to many branches and means of transport makes it possible to organize transport at a high level, ensuring the complete satisfaction of passengers. It should be noted that not all transport needs result from spatial disparity between the necessary elements of human activity. They often arise from certain habits, human behavior, or excessive consumption, and are frequently unnecessary. From the economic point of view, they are not appropriate and qualify as the perceived needs for transport (Rydzkowski, Wojewódzka-Król 2000: 37).

Transport needs stem from human needs, e.g. the need for movement and mobility. The factor of spatial arrangement of natural resources and productive forces is considered to be the oldest determinant of the transportation needs. It includes economic sources, generating transportation needs based on the development of the international division of labor, as well as the distribution of natural resources – organization, distribution, production cooperation and arrangement of markets (Grzywacz, Burnewicz 1989: 146).

Non-economic sources of transportation needs, however, cover:

- distribution of scientific knowledge, education, cultural and entertainment facilities within the area,
- government operation, including the provision of public security and national defense,
- the desire to establish and maintain human contact,
- utilization of free time,
- life-saving actions and human health (Grzywacz, Burnewicz 1989: 148).

We can therefore conclude that the socio-economic sphere has great influence on the formation of transport needs, i.e. their quality and nature. This consequently leads to a proper adaptation of the qualitative and quantitative transport service

offer to the potential demand. Therefore, in terms of macro economy, transport serves the objectives of each participant in the transport process. (Rydzkowski, Wojewódzka-Król 2000: 39).

### 3. THE IMPORTANCE OF TRANSPORT SYSTEMS IN URBAN AREAS

The development of urban areas is highly dependent on transport development processes. The economic and sociological value of such processes has an impact on the economic and social activities of the inhabitants of cities and agglomerations. Moreover, they outline the spatial urban settlement network, the standard and the way of living of the population, and the reality of the operation of business (Szołtysek 2011: 8). Transport becomes the factor bonding cities and agglomerations, which leads to the formation of specific transport systems regions.

Transport systems operating in urban areas have a specific character. This is due to the fact that they co-create a regional or national network node and an internal system with the characteristics formed under the influence of endogenous and exogenous factors. These factors include land use policies, as well as social and economic suitability. The endogenous factors describe handling shipments within cities or metropolitan areas, and the exogenous ones are concerned with the operation of the transit traffic as well as the integration of internal and external system. Other important aspects that affect the image of transport systems include the level of complexity and development of linear infrastructure networks of transport sectors, as well as the interdependence of operation in designated area subsystems (Paradowska 2011: 42).

The phenomenon of the urban sprawl<sup>1</sup> that occurs nowadays increases problems resulting from transport activity and forces changes within transport systems. Such changes introduce new solutions, establishing more effective provisions of transport services in the cities. Transport in urban areas is very important. First of all, it is designed to meet the transport needs of both passengers and freight within and between different urban agglomeration centers. An intensification of transport processes takes place in urban areas, mainly due to the high intensity of a plethora of socio-economic activities, including investment and production activities, often exercised outside the city center. Another aspect of great importance is the correlation between the flow of goods and the flow of people between the centers, especially between the main site and its satellites in metropolitan centers of a monocentric type. The creation of efficient transport connections requires an adapted transport system, continuous monitoring of the reported transportation needs, the creation of adequate infrastructure, both linear and point of various

---

<sup>1</sup> This phenomenon occurs in areas where an increase of land area assigned to an agglomeration or a city is higher than the increase of the population of the area at a specific time.

modes of transport, construction of bypasses in order to minimize transit traffic as well as an integrated public transport system (Szołtysek 2009: 55–56).

The transport sector contributes in many ways to the economic growth of all kinds of manifestations of the region and the country. Transport is one of the main determinants of economic activity as well as social and economic development, as already pointed out in the 18<sup>th</sup> century, by Adam Smith. Good transport accessibility which is determined by the richness and diversity of means of transport is mentioned among the principal factors determining the rank of a given region. The level of development of transport systems affects the attractiveness of the region as far as investment is concerned. This increases the region's economic competitiveness on the supra-regional scale (Przybyłowski 2013: 93). This is how “transport networks and zones of rapid development” are created and their task is to raise the rank of a given location and attract investors.

## 2.1. Trends in development of passenger transport in Poland

The global energy and climate trends predicted for the coming decades define a key challenge faced by the transport system: to meet the constantly growing demand for energy. An important issue in achieving the objectives of sustainable transport is not only the technological development but also human awareness properly shaping consumer preferences. Meanwhile, by analyzing behavior changes on the Polish passenger transport market, we can say that they are consistent with well-established patterns of mobility of highly-developed countries of the European Union (Table 1).

Table 1

Selected characteristics for passenger transport in Poland

Specification	Unit	1995	2000	2007	2009	2010	2013
Passenger transport	Mld pkm	176,5	210,4	291,4	332,6	342,1	371,0
Modal split of passenger transport:		100	100	100	100	100	100
Passenger cars	% pkm	62.7	70.2	80.1	83.7	82.1	86.2
Powered two-wheelers		2.2	1.8	1.8	1.9	1.9	2.0
Bus & coach		19.3	14.1	9.4	7.3	6.3	5.4
Railway		12.1	11.5	6.3	5.1	4.9	4.7
Tram & metro		2.8	2.2	1.6	1.3	1.2	1.1
Air		0.1	0.1	0.1	0.1	0.1	0.1
Sea		0.8	0.7	0.7	0.7	0.6	0.6

pkm – passenger-kilometer

Source: (*EU transport in figures 2014*: 49–50).

Intermodal shifts in the transport of people and a strong preference for passenger cars are not consistent with the paradigm of sustainable transport. In addition, it is estimated that in the coming decades, the mobility of Polish citizens will continue to increase. The demand for individual transport will be driven mainly by intensifying urbanization processes, economic prosperity, an increase in the number of middle class citizens, and intensifying migration processes. At the same time, the share of public transport represented by terrestrial passenger transport will correspond to a small part of transport needs. Meanwhile, referring to the energy characteristics of individual passenger transport, it may be noted that public transport is on average three times more energy efficient than a car. In view of the above, it can be concluded that the upward trend in energy needs of the transport sector and the emissions associated with them shall continue.

## 2.2. Traffic in the city and Poznan metropolitan area

Poznan agglomeration is monocentric and its native center is the city of Poznan – the capital of Wielkopolska (region in Poland). This agglomeration has been developing since 1918 and is currently one of the most powerful urban centers in Poland in terms of economic and social factors (Figure 1).



Geographic location and strong economy are two of the strengths of this agglomeration. The proximity of major hubs of international importance makes the metropolis an attractive place for foreign investors, especially from within logistics and automotive industries. A strong, well-established economy contributes to the fact that Poznan is now one of the best places for development. The diversity and quantity of work translates into one of the lowest unemployment rates in the country (approx.4%). On the other hand, a minimum share of inland waterway transport, relatively high maintenance costs related to it, and high housing prices represent some of the weaknesses of the agglomeration. The river Warta flowing through Poznan is one of the largest in Poland, so its regulation could contribute to an increased share of inland waterway transport in general. Urban development opportunities should be primarily connected to various EU programs and the construction of Poznan Metropolitan Railway, which will aim at providing the neighboring municipalities with a fast connection with the city (*Sustainable development...* 2014: 6). EU programs are now the main source of many investments in Poland, which leads to the development of technology and infrastructure of our country.

The main threat to the agglomeration from individual transport is the increase in the cost of public transport. This has negative consequences resulting in high congestion and more road accidents and collisions (*Traffic jams...* 2014: 19–21). What is more, this also has a negative impact on the environment and human health. The influx of foreign companies can lead to reduced revenues and, in extreme cases, bankruptcy of small family businesses in the SME sector.

Due to the extensive urbanization of the agglomeration of Poznan, the traffic on its territory, and in particular in the area of Poznan, is very heavy. Passenger mobility within the city is based primarily on public transport and private vehicles. It is complemented by the use of taxis and cycling. There are many different traffic generators in the agglomeration that attract people, causing congestion in the area at the same time. Many families living in this agglomeration are motorized, so there is a lot of traffic on the road and many traffic accidents occur, these are mainly collisions.

Modal split of total transport in the city and metropolitan area of Poznan are presented in Table 2.

Table 2

Modal split of total transport in the city and agglomeration

Means of transport	Zone of residence			
	City centre Poznan [%]	Poznań [%]	County Poznan [%]	Agglomeration Poznan [%]
1	2	3	4	5
Foot	29.4	13.0	10.8	12.1
Passenger car	26.1	38.7	65.6	49.7

1	2	3	4	5
Taxi	0.7	0.4	0.1	0.3
Urban transport	36.4	41.0	5.0	26.3
Intercity bus	0.4	0.6	3.2	1.7
Other suburban bus	0.0	0.0	0.7	0.3
Bus Staff	0.2	0.1	1.3	0.6
Train	0.3	0.1	1.7	0.8
Bicycle	4.9	4.0	5.3	4.5
Motorcycle	0.1	0.3	0.5	0.4
Other	0.2	0.3	1.3	0.7
Urban transport & suburban bus	1.1	1.1	2.6	1.7
Public transport – other combinations	0.1	0.1	0.8	0.4
Passenger car & public transport	0.1	0.4	1.1	0.6

Source: (*Research and development...* 2013; s. 54).

Given the economic and the social factors influencing the selection of vehicles, Poznan downtown residents had the best results as they frequently pursue public transport (36.4%) and move around on foot (29.4%). This may be due to the fact that main traffic generators are usually located in the city center, so the distances from places of residence to the destinations are small. If one takes residents from all of Poznan into consideration, they also usually choose public transport (41.0%) as a means of transport. 38.7% people use individual transport. Also, the number of people moving on foot decreases (13.0%). The worst record is among Poznan county's inhabitants. Nearly 2/3 of the county's inhabitants chose the car as a means of transport, and only 5.0% of people use public transport. This may be caused by limited access to transport centers and long distances to cover in order to reach chosen destinations. Overall, in the entire agglomeration, almost every other resident chooses a car to meet his/her transport needs, 26.3% use public transport, 12.1% walk, and other means of transport are used only to a small extent.

Over 60% of households in the district of Poznan are motorized, with the highest percentage of households having one car (43.1%). These indicators vary depending on the place of residence (Table 3).

Table 3

The automotive indicator of households depending on the place of residence

Place of residence	Share of households				
	Non-motorized [%]	Motorized [%]	With 1 car [%]	2 cars [%]	3 cars and more [%]
Town center Poznan	57.5	42.5	36.3	5.4	0.9
Poznan	47.1	52.9	42.2	9.0	1.7
Non-urban area of the Poznan county	19.1	80.9	40.0	32.8	8.1
The cities of Poznan County	27.3	72.7	52.6	16.1	3.9
Poznan County	22.4	77.6	45.0	26.2	6.5
Poznan Agglomeration	39.2	60.8	43.1	14.5	3.2

Source: (*Research and development...* 2013; s. 44).

Most of the households in the city center do not have a car (57,5%), whereas those that do, mostly just own one car (36,3%). This may be due to the fact that their daily transportation needs can be accomplished by alternative means of transport, including public transport. Taking into account the entire city of Poznan, the data are slightly different; however, the majority of households do have cars (52,9% of the total). Significant differences can be observed by analyzing the data scale and non-urban areas of the county. In the areas outside cities, over 80% of households are motorized. These families often have more than one car (40,9%). This is due to the fact that people living outside the city have limited access to alternative means of transport and the only way to meet their transportation needs is by using private transport.

The high percentage of motorization leads to an increased volume of traffic on the road, and is an indirect cause of road accidents and collisions. According to the data, drivers traveling through Poznan spent on average almost 12 hours a month in traffic, thus losing more than USD 1000 a year in time and productivity loses. (*Traffic jams...* 2014: 39). The roads in the city center and the main road exits are the most congested stretches. Large traffic jams also form around infrastructure works, as well as their detours. According to the information of the Municipal Police in Poznan, from January to September 2014, 335 accidents and collisions occurred within the area of the Poznan district until 6926, in which 398 people were injured and 32 were killed.

Most commonly, road accidents occurred due to:

- disregard of the ‘right of way’ rule
- speeding,



- failure to keep a sufficient distance between vehicles,
- improper reversing,
- improper lane change.

The most dangerous places, taking into account the number of road accidents are: roundabouts – Śródka, Rataje, Solidarity, Obornicka, Starołęka; intersections – Dolna Wilda – Piastowska, Jana Pawła – Baraniaka, Katowicka – Maltańska, and roads – No. 92, No. 11, No. 5 and No. 434.

### 3. CONCLUSIONS

Transport has always been present in human life, contributing significantly to the development of civilization. In contrast to the fundamental biological, sociological and cultural needs, transport needs are related to social and productive activities of human beings. The increased mobility of communities living in urban areas or agglomerations is an important factor in the changes in the organization of transport systems. Increased demand for transport both within metropolises and between them results from economic and social factors. Commuting to work or school, needs related to culture, tourism and recreation – the implementation of which is held in the cities – are some of the most significant sources of transport needs. Not without significance, in terms of increased mobility, is also the phenomenon of the urban sprawl, which extended the distance necessary to overcome in order to meet one's needs. The growth in personal transportation needs has increased the need for transport infrastructure. That is why it is very important to build a network of public transport and to promote public transport. Actions of large agglomeration centers should focus on reducing individual transport in favour of public transport. High availability of territorial, modern fleet, affordable fares, and the introduction of a number of facilities (e.g. bus lanes) should be the driving force behind public transport, and thus should encourage more people to use carrier services when carrying out daily transportation needs.

### REFERENCES

- Bartniczak B. (2013), *Sustainable transport at the regional level as an indicative measurement object*, "Economic Studies", Scientific Journal of the University of Economics in Katowice, 11–20.
- EU transport in figures, Statistical Pocketbook 2014.
- Grzywacz W., Burnewicz J. (1989), *The Economics of transport*, Ed. Communications, Warsaw.
- Paradowska M. (2011), *The development of sustainable transport systems Polish towns and cities in the integration process in the European Union – example of the Wrocław*, University of Opole, Opole.

- Przybyłowski A. (2013), *Transport investments as a factor for sustainable development of regions in Poland*, Gdynia Maritime Academy, Gdynia.
- Research and development Agglomeration Transport Plan. Stage I* (2013), Internet site: <http://www.plantap.pl/assets/Uploads/Tekst-etap-I.pdf>, (access: 15.02.2015).
- Rydzkowski W., Wojewódzka-Król K. (2000), *Transportation*, PWN, Warsaw.
- Sustainable development plan of public transport for the city of Poznan for the years 2014–2025* (2014), Internet site: <http://www.plantap.pl/plan-transportowy-dla-miasta-poznania-2014-2025/>, (access: 15.02.2015).
- Szołtysek J. (2011), *Creating of mobility the urban population*, Wolters Kluwer Polska Sp. z o.o., Warsaw.
- Szołtysek J. (2009), *Basics of urban logistics*, Ed. 2 Publisher University of Economics in Katowice, Katowice.
- Traffic jams reports in 7 major Polish cities* (2014), Deloitte Poland, Internet site: [http://korkometr.targo.pl/Raport\\_Korki\\_2013.pdf](http://korkometr.targo.pl/Raport_Korki_2013.pdf), (access: 20.10.2014).
- <http://www.aglomeracja.poznan.pl/aglomeracja/public/aglomeracja> (access: 12.02.2016).

Urszula Motowidlak

## MOBILNOŚĆ SPOŁECZNA W POLSKIM TRANSPORCIE NA OBSZARACH ZURBANIZOWANYCH W KONTEKŚCIE ROZWOJU TRANSPORTU ZRÓWNOWAŻONEGO

**Streszczenie.** Transport jest jednym z najważniejszych sektorów gospodarki państwa. Jego właściwa organizacja, głównie na obszarach miejskich, warunkuje skuteczne zaspokojenie potrzeb przewozowych osób. Potrzeby te wynikają z różnych źródeł, ale najczęściej związane są z dostępem do codziennej pracy, szkoły lub uczelni, biur, obiektów kulturalnych i sportowych. Rządy dużych ośrodków metropolitalnych, w tym również w Polsce, stoją więc przed ogromnymi wyzwaniami. Ze względu na dużą liczbę ludności i wciąż rosnące potrzeby przewozowe, władze zobowiązane są do stosowania nowoczesnych oraz efektywnych rozwiązań transportowych. Rozwój społeczny, dostęp do nowych możliwości technologicznych i nowoczesnych rozwiązań handlowych przyczynił się do wzrostu potrzeb transportowych na obszarach miejskich, jak pokazano na przykładzie wybranej aglomeracji.

**Słowa kluczowe:** transport, transport miejski, transport indywidualny, transport zrównoważony, mobilność społeczna